

Fig. 2. – *Cichlidogyrus sanseoi* n. sp. haptoral sclerites.

DB = dorsal transverse bar; DG = dorsal gripus; VB = ventral transverse bar; VG = ventral gripus; I to VII = uncinuli. Bar = 30 μ m.

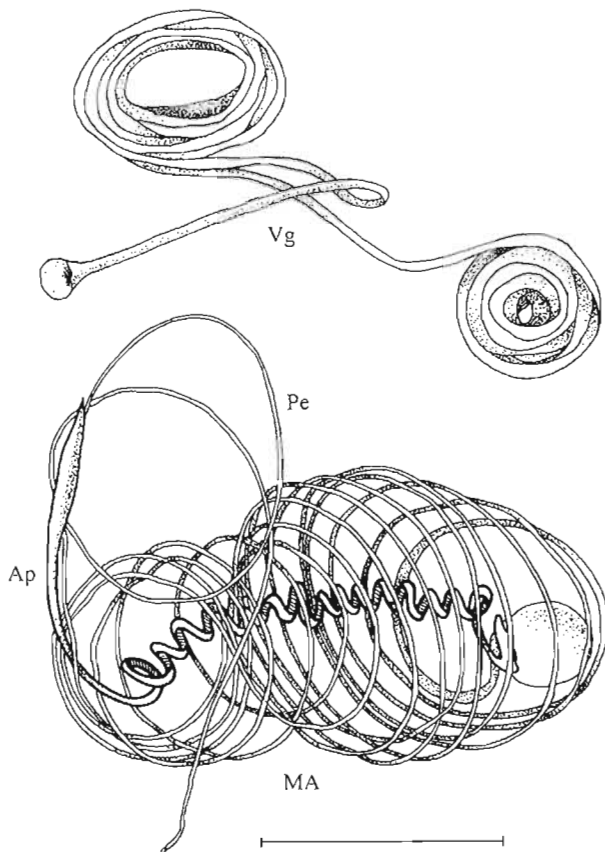


Fig. 3. – *Cichlidogyrus sanseoi* n. sp. Copulatory organs.

Ap = accessory piece; MA = male apparatus; Pe = penis; Vg = vagina. Bar = 30 μ m.

kolokoba National Park (Senegal), and in Niger River at Selingue (Mali).

Material studied: 30 individuals.

Type material: holotype deposited at the Muséum National d'Histoire Naturelle (Paris): n° 236HG, TI 233. Paratypes deposited at the Muséum National d'Histoire Naturelle (Paris): n° 236HG, TI 233 bis; and at the Natural History Museum (London): n° 2004.9.15.14-15.

Adults: 564 ± 78.6 (415-775) long, 92 ± 10.6 (72-122) wide at level of vagina. Dorsal gripus with root three times shorter than shaft, blade arched at distal end: $a = 40 \pm 1.2$ (37-42), $b = 26 \pm 0.9$ (24-28), $c = 6 \pm 0.9$ (4-7), $d = 16 \pm 11.1$ (13-18), $e = 12 \pm 0.8$ (10-14). Dorsal transverse bar: $x = 36 \pm 2.1$ (32-41), $y = 12 \pm 1.3$ (10-15), $w = 7 \pm 0.5$ (6-8), $h = 11 \pm 1.1$ (8-14). Ventral gripus, slightly heavier than dorsal, with root two times shorter than shaft, blade regularly arched: $a = 36 \pm 1.1$ (33-38), $b = 31 \pm 1.2$ (29-33), $c = 5 \pm 0.8$ (3-7), $d = 11 \pm 1$ (8-13), $e = 15 \pm 1.1$ (12-17). Ventral transverse bar arched: $x = 35 \pm 1.6$ (32-39), $w = 5 \pm 0.3$ (4-5). Uncinuli I large = 32 ± 1.4 (28-36) long, II = 11 ± 0.4 (10-12) long, III = 19 ± 0.9 (17-22) long, IV = 21 ± 1.1 (18-24) long, V = 27 ± 0.8 (25-29) long, VI = 22 ± 1.1 (18-23) long, VII = 19 ± 0.7 (17-21) long. Penis, beginning in spherical bulb without heel, extremely long (more than twice the total body length): Pe = 1418 ± 98.3 (1288-1625), spirally coiled around accessory piece, likewise spiral shaped ending with a straight portion: Ap = 213 ± 16.4 (165-245). Vagina in four por-

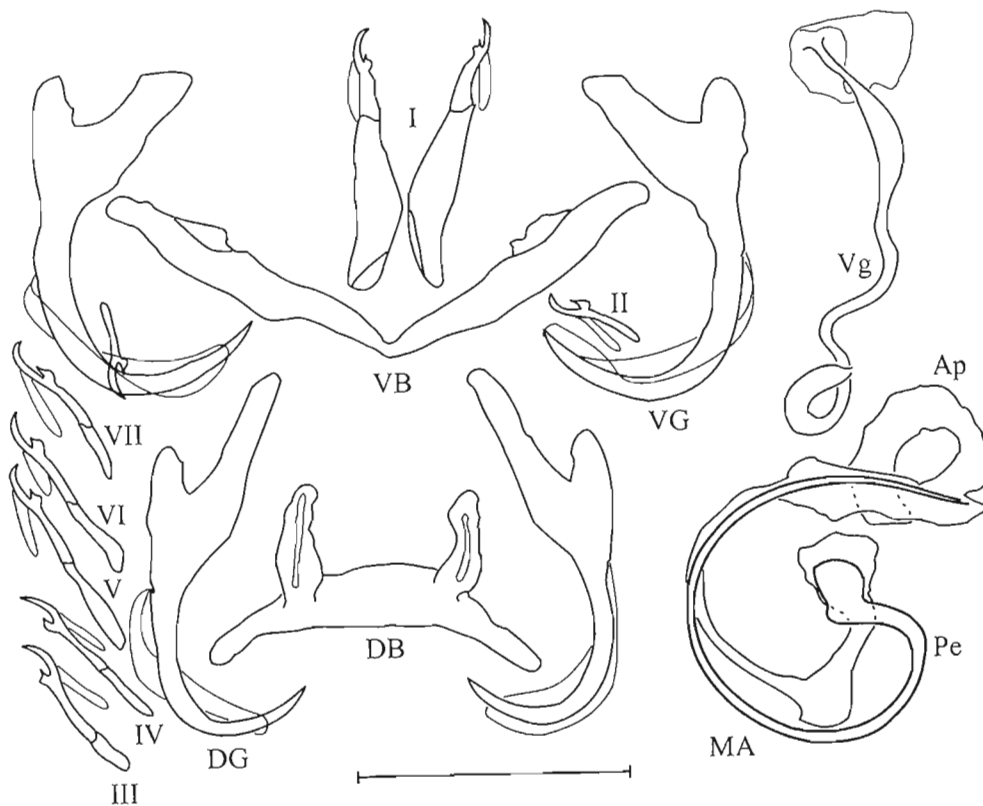


Fig. 4. – *Cichlidogyrus teugelsi* n. sp.

Ap = accessory piece; DB = dorsal transverse bar; DG = dorsal gripus; MA = male apparatus; Pe = penis; VB = ventral transverse bar; VG = ventral gripus; Vg = vagina; I to VII = uncinuli. Bar = 30 μ m.

tions, from the aperture: simple tube followed by spiral (double pitch), then another simple straight portion ending in a second spiral (simple pitch), it was felt that no viable measurement could be done on this very complex vagina.

Comments

This species is characterised by the spiral shape of the penis. Only few *Cichlidogyrus* present this particularity, even though the same shape for the penis can be found in other genera of Monogenea (e.g. *Annulotrema spiropenis* Paperna, 1969; *Thaparocleidus euzeti* Pariselle *et al.*, 2002); these are *C. arthracanthus* Paperna, 1960 described on *Tristamella simonis* (Günther, 1864), *C. euzeti* and *C. longicirrus* both from *Hemicbromis fasciatus*. It can be easily distinguished from all these species by the length of the penis and the number of turns: 130 μ m and one to two turns for *C. arthracanthus*¹; 375–390 μ m and four to five turns for *C. euzeti*; 400–500 μ m and eight to nine turns for *C. longicirrus* vs. 1288–1625 μ m; and 14 to 15 turns for *C. sanseoi* n. sp.

The name *Cichlidogyrus sanseoi* n. sp. is given for François Sanseo, technician from IRD (ex-ORSTOM) who helped us in collecting material.

¹ According to the drawing in Ergens, 1981, p. 206.

CICHLIDOGYRUS TEUGELSI N. SP. (Fig. 4)

Type host: *Hemicbromis fasciatus* Peters, 1858.

Site: gills.

Type locality: Kounougou River (Ivory Coast).

Other records: also found, on the same host, in a little river at Adiopodoumé, Km 17 Dabou Road (Ivory Coast), in Gambia River at Niokolokoba National Park (Senegal), in Niger River at Selingue (Mali).

Material studied: 30 individuals.

Type material: holotype deposited at the Muséum National d'Histoire Naturelle (Paris): n° 237HG, TI 234. Paratypes deposited at the Muséum National d'Histoire Naturelle (Paris): n° 237HG, TI 234 bis; and at the Natural History Museum (London): n° 2004.9.15.12-13.

Adults: 528 \pm 55.9 (403–605) long, 86 \pm 9.6 (68–100) wide at level of vagina. Dorsal gripus with root three times shorter than shaft, blade arched at distal end: a = 41 \pm 1.6 (35–45), b = 27 \pm 1.2 (25–31), c = 5 \pm 0.9 (3–7), d = 17 \pm 1.7 (12–20), e = 11 \pm 0.7 (10–13). Dorsal transverse bar: x = 35 \pm 1.7 (32–38), y = 12 \pm 1 (10–13), w = 8 \pm 0.9 (7–10), h = 11 \pm 1.2 (8–14). Ventral gripus, slightly heavier than dorsal: a = 36 \pm 1.1 (33–38), b = 31 \pm 1.4 (29–34), c = 5 \pm 1 (3–7), d = 11 \pm 1.5 (8–14), e = 15 \pm 1.2 (12–17). Ventral transverse bar arched: x = 34 \pm 2.7 (31–39), w = 6 \pm 0.5 (4–7). Large uncinulus I = 31 \pm 1.6 (28–37) long, uncinulus II = 10 \pm

0.5 (9-12) long, III = 18 ± 1.2 (17-23) long, IV = 20 ± 1.5 (18-25) long, V = 24 ± 1.2 (21-29) long, VI = 21 ± 1.1 (19-23) long, VII = 18 ± 0.8 (16-20) long. G-shaped penis, beginning in sub-spherical bulb with irregular heel: Pe = 99 ± 4.3 (90-111). The accessory piece, linked to the junction between heel and basal bulb, is made of two parts: a large sclerotised extremity with a large semi-circular expansion, and a thin base with a moderate trapezoidal expansion: Ap = 74 ± 3.9 (69-87). The vagina is a narrow and sinuous tube, with a slightly sclerotized plate close to the aperture: V = 72 ± 7.2 (61-88), v = 3 ± 0.3 (3-4).

Comments

This parasite belongs to the group of *Cichlidogyrus* with large uncinulus I, short uncinuli III to VII and a long (between 60 and 150 μm) non spirally coiled penis². This group includes *C. bychowskii* (Markevich, 1934) described on *Hemichromis bimaculatus*; *C. nandidae* Birgi & Lambert, 1986 described on *Polycentropsis abbreviata* Boulenger, 1901; *C. arfii* Pariselle & Euzet, 1995 described on *Pelmatochromis buettikoferi* (Steindachner, 1894); and *C. albareti* Pariselle & Euzet, 1998 described on *Tilapia brevimanus* Boulenger, 1911. The parasite herein described is easily distinguishable from all these species by the shape of the penis:

- from *C. arfii* and *C. albareti* (thin and G-shaped *vs* large and slightly sinuous or thin and slightly C-shaped).

- from *C. bychowskii* and *C. nandidae* (G-shaped *vs* looped).

The name *Cichlidogyrus teugelsi* n. sp. is given in memory of Dr. Guy Teugels, ichthyologist from the Musée Royal d'Afrique Centrale (Tervuren, Belgium) recently deceased and who provided a great deal of material from numerous locations in Africa.

DISCUSSION

The examination of geographical distribution of *Hemichromis fasciatus* gill Monogenea shows that two groups of species (*C. dageti/C. euzeti/C. longicirrus* and *C. sanseoi/C. teugelsi*, highlighted in Table I) are not present in all the host distribution area. The first one is only from Southern part, when the second one is only from Northern part, the limit seems

[as observed by Bilong Bilong & Euzet (1995) on two *Onchobdella* species (*O. spirocirra* and *O. bopeleti*) coming from two different but related host species (*Hemichromis fasciatus* and *H. bimaculatus*)] suggest a vicariant speciation between two isolated populations of parasites, thus of hosts. These data lead us to think that two closely related host species are both designated as *Hemichromis fasciatus*. The late G. Teugels (pers. comm.), ichthyologist from the Musée Royal de l'Afrique Centrale (Tervuren), supported the same hypothesis after morphological studies.

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